

Summary of Preliminary Assessment on Structural, Fire and Electrical Safety

Name of the Factory	: CLIFTON TEXTILES & APPARELS LTD.
Address of the Factory	: 180, Baizid Bostami Road Nasirabad I/A, Area-1, Building -1, Chittagong
Present Status of the Factory	: Under Operation
Structural assessment conducted by	: Alliance
Date of Structural Inspection	: 31-Jan-15
Fire & Electrical assessment conducted by	: Alliance
Date of Fire & Electrical Inspection	: 31-Jan-15
BGMEA Membership No	: 3856

BASIC INFORMATION:

There is only one 6-storied building. The following general information was noted:

- i. Building Usage Type : Garments Factory.
- ii. Structural System : 6-Storied RCC Beam-Column Structure + Steel Truss Roof Top Shed. According to Design documents, Building foundation system is pile foundation and floor slab is two way Beam-slab system.
- iii. Floor System : Beam Supported slab.
- iv. Floor Area : 191,740 Sft.
- v. No. of Stories : 6 Storied RCC + Roof Top Shed.
- vi. Construction Year : 2003-2005.
- vii. Foundation Type : Pile foundation.
- viii. Design Drawings : Available.
- ix. Soil investigation Report : Available
- x. Construction Materials : RCC.
- xi. Generator : Ground Floor.

RECOMMENDATIONS FOR CORRECTIVE ACTION:

The recommendations of corrective action for Structural, Fire and Electrical Safety comprises of Short Term, Mid Term and Long Term basis are as follows:

The recommendations for Structural Safety corrective actions are:

Immediate : NA

Short Term: (3 Weeks) :

- i. "Develop a program to ensure that all live loads for which a floor or roof has been designed for will not be exceeded. The designated Load Manager shall over see this program and ensure it is enforced."
- ii. Designate a representative as the Factory Load Manager. The Factory Owner shall ensure that at least one individual, the Factory Load Manager who is located onsite full time at the factory, is trained in calculating operational load characteristics of the specific factory. The Factory Load Manager shall serve as an ongoing resource to RMG

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vendors and be responsible to ensure that the factory operational loads do not at any time exceed the factory floor load limits as described on the Floor Load Plans.

Mid Term (6 Weeks)

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- i. Engage a qualified structural engineer to develop the required documents including core test to confirm the structural integrity of the buildings. Documents must comply with Alliance Standard Part 8 Section 8.19 and 8.2
- ii. Engage a qualified structural engineer to confirm and document that provisions have been made to accommodate concentrated loads. If provisions have not been made, have a qualified structural engineer develop a remediation plan.
- iii. Have a qualified structural engineer develop Floor Loading Plans for all the three buildings as per the requirements of Part 8 Section 8.20.5.3
- iv. Have a qualified structural engineer prepare load plans for all the three buildings including the information required in Section 8.20 of the Alliance Standard.
- v. Provide signage or the appropriate markings at all areas used for storage to indicate the acceptable loading limits detailed in the Load Plan.

Long Term (6 Months)

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- i. Factories should apply for Certificate of Occupancy to proper authority.

The recommendations for Electrical Safety corrective actions are:

Immediate (3 to 6 Days)	Remove all dirt, debris, lint, water, oil, and improperly stored materials from the substation room.
Short Term (3 Weeks)	Provide capacity information labels (Maximum current rating, no of circuit breakers etc.) for Switchboards and distribution boards.
Mid Term (6 Weeks)	Provide electrical insulation mats in front of distribution boards. Clear identification/markings must be available at LT, MDB and DB MCB/MCCB. Clear and permanent identification marks are required to be painted in all distribution.
Long Term (6 Months)	Complete Thermographic scans at least on a three year cycle. Thermographic scans should be completed in accordance with the Standard for Infrared Inspection of Electrical Systems & Rotating Equipment and NFPA70B or a comparable standard. Develop an Insulation Resistance Measurement Program that ensures deterioration of insulation resistance will be identified quickly. Testing should be in compliance with International Electrical Testing Association (NETA). All transformers, switchgears etc. shall be subject to an insulation

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	<p>resistance measurement test to ground after installation but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches etc. and between each phase and earth.</p> <p>Have a qualified electrical engineer; design a lightning protection system according to the BNBC requirements. Have a licensed electrician install the designed system. This is a violation of Section 2.9 of BNBC, 2006.</p>
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The recommendations for Fire Safety corrective actions are:

Immediate (3 to 6 Days)	Keep areas beneath cutting tables clear of combustibles as all times.
Short Term (3 Weeks)	Keep all egress doors unlocked in the direction of egress at all times. Remove all locking devices from all egress doors and means of egress components.
Mid Term (6 Weeks)	<p>Post emergency egress map at the entrance to each exit stair and main points of egress.</p> <p>Develop a testing and maintenance program that ensures the operation of all means of egress lights are verified at least once per year. If battery-operated lights are used, these lights shall be tested on a monthly basis. Functional testing of battery powered lights shall be provided for a minimum 90 min once per year.</p> <p>Post the maximum occupant load for every assembly and production area in a conspicuous space near the main exit or exit access doorway for the space.</p> <p>Develop a testing and maintenance program that ensures the emergency power for exit signs is tested at least once per year. If battery operated signs are used, these lights are tested on a monthly basis. Functional testing of battery powered signs is provided for a minimum 90 min once per year.</p> <p>Provide stair designation signs at each floor entrance from the stairs to the floor in English and Bengali. Signs shall be indicating the name of the stair and the floor level. Signs shall be posted adjacent to the door.</p> <p>Provide identification signs with permanently marked, water proof metal or rigid plastic for the required components of sprinkler system per NFPA 13, chapter-6 System components and hardware.</p>
Long Term (6 Months)	<p>Reduce the occupant load per the capacity of available means of egress (stair) or increase the capacity of means of egress per BNBC 2006 part 4 chapters 3 Table-4.3.2.</p> <p>Provide required fire rated doors in all exits. Fire doors shall be of the side hinged, swinging, self-closing type and shall swing in the direction of egress. New door shall have a</p>

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	<p>minimum clear width of 1.0 m (39 in.). Consult a qualified fire protection engineer to design the fire rated door.</p> <p>In accordance with Alliance Standard Section 6.9.2.2, increase the landing widths to make it equal to the width of the stairs or reduce the overall available capacity of the stairs as calculated in Section 6.5 (this may also affect the maximum occupant load of any floor or story of the building). Review the stair configuration and specific egress capacity requirements to establish compliance options.</p> <p>Provide required fire resistance rated opening protection (Door, Window, Hatch Cover etc.) at opening and penetrations through fire rated assemblies or close the unprotected openings with fire-resistance rated construction as required. Consult a qualified fire protection engineer to design the required rated opening protection.</p> <p>Install automatic sprinkler system throughout the building as per NFPA 13. Any newly installed automatic sprinkler system shall be evaluated for compliance with the design pressure and flow demands of NFPA 13. Consult a qualified fire protection engineer before installing new system. Automatic sprinkler system installation is to be tested for final acceptance in presence of Alliance and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance of the installation by the Alliance as per clause 5.3.4. Acceptance testing of the installation shall be in accordance with NFPA 13 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.</p> <p>Provide 2-hour fire-resistive rated barriers at exit enclosures with 1.5-hour fire-rated opening protection (Door, window, etc.). The new fire rated door shall be side-hinging, swinging, with auto closure and without locking arrangement. Minimum width of new fire rated door will be 1.0 m (39 in.). Consult a qualified fire protection engineer to design the required rated construction barriers with opening protection.</p> <p>Install A Class III standpipe system to meet the requirements of Alliance Standard Section 5.4. Consult a qualified fire protection engineer before modify or installing a new system as per NFPA 14. Any newly installed standpipe system needs to be evaluated for compliance with the design pressure and flow demands of NFPA 14.</p> <p>Evaluate the capacity and adequacy of the existing fire pump to determine if it can supply the required installation of standpipes. If necessary, modify the fire pump for the facility in accordance with NFPA 20 to meet the demands of the connected fire protection systems, along with a stored source of water sufficient to meet the demands in accordance with NFPA 22. Fire pump installation is to be tested for final acceptance in the presence of Alliance and a final inspection of the installation shall be conducted by the Alliance prior to final acceptance of the installation by the Alliance as per clause 5.5.5. Acceptance testing of the</p>
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installation shall be in accordance with NFPA 20, 22, and 25 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.

Automatic fire alarm and detection systems shall be installed throughout all new and existing buildings in accordance with NFPA 72 and Alliance Standard. The pull stations at egress points, centralized and addressable smoke or fire detection devices throughout, and visual and audible devices spaced appropriately in accordance with NFPA 72. Installation of automatic fire alarm and detection systems shall be required to provide shop drawings as outlined in NFPA 72. These drawings shall include all details as outlined in NFPA 72. Acceptance testing of the installation shall be in accordance with NFPA 72 testing requirements. Documentation of all testing shall be submitted to the Alliance for review prior to final acceptance by the Alliance.

Provide training for the required number of people (25% of total workers) certified in firefighting, first aid, and rescue training by the appropriate authority.

Install handrails in all stairs on both sides of the stairs.

Provide re-entry per Alliance Standards Part 6 Section 6.8 Doors and Gates. And door shall be kept lock free in all situations. Re-entry floor and door shall be marked with proper signage.

Remove the non-rated components, replace them with rated materials, or provide fire resistive rated protection for the steel shed construction to meet permitted construction type materials and requirements.

Provide Fire Department (Siamese) connections with proper markings in accordance with Alliance Standard Section 5.5.4. Connections shall match the Fire Service and Civil Defense hose thread standard. Ensure that a stored source of water sufficient to meet the demands in accordance with NFPA 22 is provided for the facility. Consult a qualified fire protection engineer to design this requirement.

Provide fire-resistive rated construction barriers between hazard types in accordance with Alliance Standard Sections 3.4 and 4.5. Consult a qualified fire protection engineer to design the required rated construction barrier.

Maintain a 460 mm (18 in.) minimum clearance from the top of storage to the sprinkler deflector for all storage areas.

Define and mark minimum aisles which shall be maintained free of storage in accordance with NFPA 13 chapter 12, based on the design criteria used for the sprinkler system.

Provide monitoring for all valves controlling automatic sprinkler systems, fire pumps, and water supply systems from the existing Fire Alarm Control Unit. The valves shall be electrically supervised by a listed fire alarm system control unit as per Alliance Standard Section 5.3.5 and NFPA 13 chapter 7 System requirements. Consult a

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	<p>qualified fire protection engineer for these purposes.</p> <p>Establish an inspection, testing and maintenance program for all fire extinguishers. Program must comply with the requirements of NFPA 10.</p> <p>Provide a beveled slope to not exceed 12.7 mm (1/2 in). Also provide additional signage or floor markings.</p> <p>The hangers, bracing, and restraint of sprinkler piping system shall be modified to meet the requirements of NFPA 13 chapter 9. Consult a qualified fire protection system designer for that modification.</p> <p>Establish an inspection, maintenance and testing program for the sprinkler system. Program must to comply with the requirements of NFPA 25.</p> <p>Complete fire department per-planning activities with the local Fire Service and Civil Defense.</p> <p>Install an approved audible device connected to the automatic sprinkler system which will activate via water flow equal to the flow of one sprinkler. Once connected to the existing fire alarm system, activation of the water flow must activate the notification appliances for the building. These arrangements need to be designed and implemented in accordance with NFPA 13 chapter 7 System requirements. Assign a qualified fire protection engineer for these purposes.</p> <p>Establish written corporate and plant policies on housekeeping to ensure scheduled cleaning for floor, wall, ceiling, supply and return air ventilation systems. Promptly reschedule skipped cleanings. Provide a documented line of authority for authorizing a cleaning delay and rescheduling.</p> <p>Establish an inspection, testing and maintenance program for the standpipe and hose system. Program must comply with the requirements of NFPA 25.</p> <p>Revise the inspection, testing and maintenance program for the fire pump. Program shall comply with NFPA 25 including training appropriate workers on proper operation of fire pump.</p> <p>Develop a hot work permit program. The program must comply with the requirements of NFPA 51B.</p>
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